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ABSTRACT

Theory and research on bilingualism and its relationship to cognitive development have provided mixed results, especially in relation to the value of United States bilingual education programs. Little of the existing research on bilingualism is generalizable to U.S. minority language groups. However, one study of children in a bilingual program designed to see if intellectual abilities are related to the student's degree of bilingualism rather than to compare bilingual and monolingual children found that a positive relation exists between bilingualism and various abilities, such as the ability to think abstractly about language and to think nonverbally. In addition, the correlation between the students' abilities in the two languages developed in the bilingual education program became stronger in the course of the program, supporting the idea of the interdependence of the languages of the bilingual. While these results do not suggest that bilingualism is a valuable educational intervention strategy in itself, they do argue for increased research in cross-language skill transfer and the role of bilingualism in academic learning. (MSE)

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Cognitive Development in Bilingual Instruction

Kenji Hakuta

Our metaphors for the human mind are filled with allusions to the image that it is a container with limited capacity. We cram for exams, vent our frustrations, and empty our minds. If the mind is a vessel to be filled, and if language is something that fills it, then one might ask some serious questions about the consequences of bilingualism on mental development. Two languages take up more room than one, and thus one might wonder whether the process of becoming bilingual might impede the mental development of the individual by taking up too much space, as it were. To the extent that one believes in this general idea, one could oppose bilingual instruction in young children on the grounds that it would be detrimental to their overall cognitive development. I am sure that practitioners in bilingual education have all heard variations aplenty on this theme from various opponents of bilingual education. In this paper, I would like to comment on the question of bilingualism and cognitive development, particularly in research relating to current U.S. bilingual education.

There is a curious history to the psychological research behind the cognitive development of bilingual children that needs some elaboration, if only because this history has not been told often enough. The issue dates back to the turn of the century when there was concern in this country about the poor performance of immigrants—particularly those of southern and eastern European origins—on intelligence tests. How could their inferior performance on these tests be explained? Those who believed intelligence test performance to be determined by heredity, including psychologists such as Lewis Terman and Florence Goodenough, were willing to explain this inferior performance by saying that the immigrants were from groups with low innate intelligence. On the other hand, those who argued for the environmental influences on intelligence looked around for other explanations and found the cause to be in bilingualism. The environmentalists argued that the attempted use of two languages resulted in mental confusion. Thus, for environmentalists, the new immigrants were of inferior intelligence not because of their genes, but because of their bilingualism (Hakuta 1985).

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The environmentalist account of the negative consequences of bilingualism went hand in hand with efforts by behaviorist psychologists to explain the mental composition of individuals in terms of overt behavior. Indeed, much of what we call code switching in bilinguals today was presented in those days as evidence for mental confusion (Smith 1939).

Beginning in the late 1950s, the tide in the social sciences turned away from the behaviorist (sometimes called empiricist) orientation toward what is called a cognitivist view. Changes in the philosophical orientation of an entire community of scientists are difficult to link with particular individuals, but one major catalyst for change was the linguist Noam Chomsky, who argued effectively that our language and mental capacities are far more powerful and interesting than what can simply be observed in behavior. The cognitivists introduced the new metaphor of the mind—not as that of a container that is the receptacle for information introduced from the outside—but rather as a machine with wired-in properties, a problem-solver, that stands ready to be stimulated (but not created) by the environment.

As the era of the "cognitive sixties" began, perhaps not coincidentally, Elizabeth Peal and Wallace Lambert at McGill University in Montreal conducted their important study (published in 1962) on the relationship between bilingualism and intelligence. What they found was that bilingual children who were equally proficient in both their languages, when compared with a similar group of monolingual children, showed better performance on all sorts of measures of intelligence. Their finding, which suggested that bilingualism might have a positive effect on intelligence, contradicted the claims of the earlier research of the behaviorist psychologists. For Peal and Lambert, their own finding was not troubling because they did not share the behaviorist views of the mind as the passive receptacle of experience. Rather, they viewed the bilingual mind from the cognitive perspective, as one that eagerly tries to solve problems presented by the environment. Presumably, a mind that has worked on two problems, i.e., learning two languages, has had more experience solving problems than a mind that has worked on just one language. Thus, Peal and Lambert (1962, 20) characterized a bilingual child as "a youngster whose wider experiences in two cultures have given him advantages which a monolingual does not enjoy. Intellectually his experience with two language systems seems to have left him with a mental flexibility, a superiority in concept formation, a more diversified set of mental abilities. . . . In contrast, the monolingual appears to have a more unitary structure of intelligence which he must use for all types of intellectual tasks."

Since Peal and Lambert's seminal study, a large number of studies have been conducted with bilingual children in various parts of the world using a variety of tasks of mental performance (Diaz 1983; Cummins 1984;

McLaughlin 1984). The results generally support Peal and Lambert's conclusion of the superiority of bilinguals. Such results, if true and not the result of experimental artifact, would be encouraging to the support of bilingual education, since they suggest that (1) the fear that two languages would overload the mental capacity of children in unfounded and (2) there could be an advantage of bilingualism over and beyond the obviously beneficial fact that the children would know two languages.

One problem, among others, that has plagued the ability to make generalizations from these conclusions to the case of bilingual education in the United States has to do with the fact that most of the studies were conducted with subject populations other than U.S. minority language students, the primary exceptions being studies by Duncan and De Avila (1979) and Kessler and Quinn (1980). Our research with Puerto Rican elementary school students in the bilingual program in the New Haven Public Schools attempted to extend these findings to a subject population more relevant for generalizations in the U.S. context (Hakuta 1984; Hakuta and Diaz 1984; Galambos and Hakuta 1984; Ferdman and Hakuta 1985). In addition, we corrected for a number of methodological problems with the standard research paradigm utilized in most of the research. For example, rather than trying to compare our bilingual sample with a group of monolingual students, we decided to look *within* the bilingual group to see if intellectual abilities are related to the students' degree of bilingualism (Hakuta and Diaz 1984).

What we found, indeed, is that even within our low-income, Hispanic minority language sample, using relatively rigorous experimental controls, a positive relationship exists between bilingualism and various abilities. For example, there was a positive relationship between bilingualism and the students' ability to think abstractly about language (a skill that has been called metalinguistic ability and is hypothesized to be related to reading ability in elementary school students). We also found a relationship between bilingualism and nonverbal thinking as measured by a standard test of intelligence.

We should be cautious about the implications that this finding would have on practice. For example, would one want to use bilingualism as an intervention with which to raise children's cognitive performance? If I were asked this question, I would give a firm "no." The magnitude of the effect of bilingualism on cognitive ability *in isolation* is hardly large enough to justify such a rash move, even though the effect may be statistically significant, as McLaughlin (1984) has pointed out. However, if bilingualism in and of itself were a desirable end product of education for whatever other reason, be it that it expands the worldly perspective of children or enables them to participate more broadly in world events, then enhanced cognitive ability would be a superb premium to go along with bilingualism. Indeed, what I think matters most in all of this research

is the finding that there are no negative cognitive effects of bilingualism. What we now know is that the mind is not a passive receptacle with limited capacity, but one that benefits from diversity of experience and is capable of building upon itself.

One of the more encouraging findings from our study is the fact that there is an increasing correlation between the abilities of the children in the two languages over time. That is, when the students first entered the bilingual program, their abilities in Spanish and English were unrelated. However, by the end of three years, there were correlations as strong as $r = .70$ between the languages. The pattern of correlations also suggested to us that children who came in with a strong base in their native language, Spanish, ended up with the strongest abilities in English, a finding that supports Cummins's contention of the interdependence of the languages of the bilingual. One implication of this finding is that the development of either language can be used as a foundation for the development of the other.

Now that we have answered the question of the role of bilingualism in cognitive development, at least in a general way, what next? Of primary importance to practitioners in bilingual education, I believe, is the question of whether, and how, skills acquired in one language transfer to the other. For example, how do grammatical concepts and rules acquired in Spanish reading transfer to reading in English? The importance of transfer for the practitioner in bilingual education has been underscored by Chamot (1983) in her important piece "How To Plan a Transfer Curriculum from Bilingual to Mainstream Instruction." Research by Susan Goldman (1983) indeed suggests that similar strategies are employed by children in narrative comprehension in L_1 and L_2. This area of cross-language transfer of skills, I believe, is an important avenue of research in clarifying the role of bilingualism in academic learning and is an area of research where we have just embarked on a systematic series of studies in New Haven. This kind of research geared specifically to the academic skills that are taught in the classrooms can be immediately filtered back to the practitioner through curriculum development that is responsive to the particular tasks that do and do not transfer readily. We are particularly excited because this program of research is just at the level of analysis where both theory and practice can co-exist and be mutually reinforcing.

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